Please cancel claims 62-67.

1. (Amended) A method of forming a planar waveguide structure, comprising:

forming a first graded layer on a substrate, the first graded layer comprising silicon and germanium wherein the germanium concentration increases with the height of the first graded layer; and

A4

forming a second graded layer immediately over the first graded layer, the second graded layer comprising silicon and germanium wherein the germanium concentration decreases with the height of the second graded layer.

16. (Amended) The method of claim 13 wherein the chemical vapor deposition process comprises:

introducing into a deposition chamber a first source gas for forming silicon film on a substrate;

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introducing into a deposition chamber a second source gas for forming SiGe film on a substrate; and

introducing H_2 into the deposition chamber while maintaining a determined pressure and temperature in the deposition chamber.

20. (Amended) The method of claim 16 wherein the chemical vapor deposition process for forming the first and second graded layers comprises:

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controlling the flow rate of the second source gas according to a determined concentration profile of Ge on a substrate; and

forming a film on a substrate, the film comprising Ge at a first concentration at a first point in the film and a second concentration different from the first concentration at a second point in the film.

A7

23. (Amended) A method of forming a planar waveguide structure, comprising:

etching a pattern into a substrate;

forming a first graded layer within said pattern, the first graded layer comprising silicon and germanium wherein the germanium concentration increases with the height of the layer;

Amend forming a uniform layer on the first graded layer, the uniform layer containing silicon and germanium wherein the germanium concentration is constant; and

forming a second graded layer on the uniform layer, the second graded layer comprising silicon and germanium wherein the germanium concentration decreases with the height of the second graded layer.

29. (Amended) The method of claim 28 wherein the blocking layer comprises epitaxial silicon. A8

31. (Amended) The method of claim 30 wherein the cladding layer comprises epitaxial silicon. A9

42. (Amended) The method of claim 29 wherein the chemical vapor deposition process comprises:

introducing into a deposition chamber a first source gas for forming silicon film on a substrate; A10

introducing into a deposition chamber a second source gas for forming SiGe film on a substrate; and

introducing H_2 into the deposition chamber while maintaining a predetermined pressure and temperature in the deposition chamber.

46. (Amended) The method of claim 42 wherein the chemical vapor deposition process for forming the first and second graded layers comprises:

controlling the flow rate of the second source gas according to a determined concentration profile of Ge on a substrate; and A11

forming a film on a substrate, the film comprising Ge at a first concentration at a first point in the film and a second concentration different from the first concentration at a second point in the film.

51. (Amended) A computer readable medium comprising executable program instructions that when executed cause a digital processing system to perform a method comprising:

forming a first graded layer on a substrate, the first graded layer comprising silicon and germanium wherein the germanium concentration increases with the height of the first graded layer; and

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forming a second graded layer immediately over the first graded layer, the second graded layer comprising silicon and germanium wherein the germanium concentration decreases with the height of the second graded layer.

53. (Amended) The method of claim 51 wherein the chemical vapor deposition process comprises executable program instructions for:

introducing into a deposition chamber a first source gas for forming silicon film on a substrate;

A13

introducing into a deposition chamber a second source gas for forming SiGe film on a substrate; and

introducing H_2 into the deposition chamber while maintaining a determined pressure and temperature in the deposition chamber.

57. (Amended) A method of forming a planar waveguide structure, comprising:

etching a pattern in a substrate;

forming a first graded layer on the pattern etched in the substrate, the first graded layer comprising silicon and germanium wherein the germanium concentration increases with the height of the layer;

forming a uniform layer on the first graded layer, the uniform layer containing silicon and germanium wherein the germanium concentration is constant; and

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forming a second graded layer on the uniform layer, the second graded layer comprising silicon and germanium wherein the germanium concentration decreases with the height of the second graded layer.

60. (Amended) A method of forming a planar waveguide structure, comprising:

forming a first graded layer on a substrate, wherein the first graded layer comprises a first and a second optical material, wherein the concentration of the first optical material and

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the index of refraction of the first graded layer increases with the height of the first graded layer; and

forming a second graded layer immediately over the first graded layer, the second graded layer comprising the first and second optical materials wherein the concentration of the first optical material and the index of refraction of the second layer decreases with the height of the second graded layer.

61. (Amended) A method of forming a planar waveguide structure, comprising:

etching a pattern into a substrate;

A15 end

forming a first graded layer within said pattern, wherein the first graded layer comprises a first and a second optical material, wherein the concentration of the first optical material and the index of refraction of the first graded layer increases with the height of the first graded layer;

forming a uniform layer on the first graded layer, the uniform layer containing first and second optical materials wherein the first optical material concentration is constant; and

forming a second graded layer on the first graded layer, the second graded layer comprising the first and second optical materials wherein the concentration of the first optical material decreases with the height of the second graded layer;

wherein the index of refraction of the uniform layer is greater than the index of refraction of the first and the second graded layers.